UECM1404 Theory of Interest Tutorial 1

TUTORIAL 1

UNIVERSITI TUNKU ABDUL RAHMAN

Faculty:	FES	Unit Code:	UECM1404
Course:	AS, FM	Unit Title:	Theory of Interest
Year:	1	Tutor:	Dr Chin Jia Hou
Session:	202206		

Q1. The managers of Fargo Mutual Fund have reported an average effective annual return of 12% for the 10 years ending 31 December, 2021, and an average effective annual return of 17% for the 6 years ending 31 December, 2021. Find the average effective annual return for the 4 years ending 31 December, 2015.

4.90%

Q2. Edward deposits 29,000 in a bank. During the first 14 years, the bank credits a simple annual interest rate of 7% for 14 years, and during the next 14 years, the bank credits an annual compound interest rate of 6%. What would Edward have in the bank at the end of 28 years?

129821.1

Q3. At an annual effective interest rate of i, $i > 0$, the following are all equal:

- the present value of 14,000 at the end of 9 years;
- the sum of the present values of 5,500 at the end of year t and 62,000 at the end of year $2t$; and
- 8,286.58 immediately.

Calculate the present value of a payment of 6,000 at the end of year $t + 4$ using the same annual effective interest rate.

1539.35

Q4. Fund A is invested at an effective annual interest rate of 3%. Fund B is invested at an effective annual interest rate of 2%. At the end of 24 years, the total in the two funds is 19,500. At the end of 35 years, the amount in Fund A is twice the amount in Fund B. Calculate the total in the two funds at the end of 11 years.

13920.65

Q5. Edbert deposits 300 into a savings account at time 0, which pays interest at an annual nominal rate of i, compounded semiannually. Miko deposits 1200 into a different savings account at time 0, which pays simple interest at an annual rate of i. Edbert and Miko earn the same amount of interest during the last 6 months of the 24-th year. Calculate i.

0.0599

UECM1404 Theory of Interest Tutorial 1

Q6. Jenny deposits 2,000 into a bank account. The bank credits interest at a nominal annual rate of i convertible semiannually for the first 10 years and a nominal annual rate of $2i$ convertible quarterly for all years thereafter. The accumulated amount in the account at the end of 8 years X. The accumulated amount in the account at the end of 20.0 years is 55,658.21. Calculate X.

4855.45

Q7. You are given:

- Fund R pays interest at the rate 6% convertible monthly;
- Fund S pays interest at a force of interest $\delta_t = \frac{1}{(t+20)}$;
- Kent depositd M into each fund;
- At the end of 12 years; the accumulated amount in Fund R was 4,000 and the accumulated amount in Fund S was D.

Determine D.

3120.81

Q8. Fund X starts with 2600 and accumulates with a force of interest $\delta_t = \frac{1}{19-t}$ for $0 \leq t < 19$. Fund Y starts with 2570 and accumulates with an interest rate of 3.00% per annum compounded semi-annually for the first 7 years and an effective interest rate of i per annum thereafter. Fund X equals Fund Y at the end of 8 years. Calculate i.

0.4187